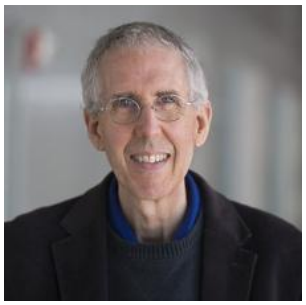
Bilkent EEE Distinguished Seminar Series

Bilkent University - Department of Electrical and Electronics Engineering



Structured Graphical Models

Prof. Alfred Hero

University of Michigan

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Structured graphical models are used for estimating statistical dependencies between multiple covariates when one imposes structural properties on the matrix of pairwise covariate dependencies. Certain types of structural properties may facilitate computation, reduce sample complexity, reflect physical generative mechanisms, or penalize undesirable properties of the covariance or precision matrix estimator. In this talk we focus on two types of structured graphical models. In the first part of the talk we present recent results on Kronecker-separable covariance models, commonly used for analysis of multi-way data. In the second part we impose a structural penalty on the precision matrix to enforce cluster fairness. The first part of the talk is work with Dogyoon Song and the second part of the talk is work with Davoud Tarzenagh and Laura Balzano.

Bio: Alfred Hero is the John H. Holland Distinguished University Professor of Electrical Engineering and Computer Science and the R. Jamison and Betty Williams Professor of Engineering at the University of Michigan, Ann Arbor. From 2022 to 2025 he served as a Program Director in the CISE Directorate at the National Science Foundation. He is a Fellow of the Institute of Electrical and Electronics Engineers (IEEE) and the Society for Industrial and Applied Mathematics (SIAM). He is a recipient of the Fourier Award in Signal Processing from the IEEE.

His research is on data science and developing theory and algorithms for multimodality data collection, fusion, analysis and visualization that use statistical machine learning and distributed optimization. These are being applied to wearable technologies for personalized health and predictive medicine, spatio-temporal networks in biology, climate, and social discourse, anomaly detection, and data analysis for international security.